

LAB: PERIODIC TRENDS (ATOMIC RADII)

Students: Please read the following information given below, and then on your lab day put the following into your notebooks:

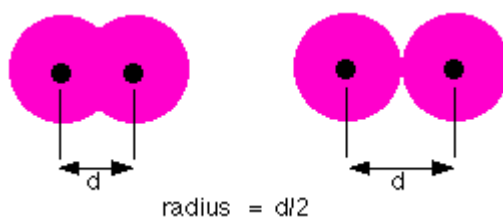
1) Date, 2) Partner, 3) Title, 4) Purpose, 5) Materials, 6) Safety, and 7) Data Table (no observations section is needed)

For this lab, an excel graph will be made using atomic radii data that is given below. This data will be used to graph atomic radius vs. atomic number.

No formal report necessary.

Questions on the last page need to be printed out. You will hand in these questions and the graph one week after the completion of the lab.

Unlike a ball, an atom doesn't have a fixed radius. Therefore, the radius cannot be directly measured. The radius of an atom can only be found by measuring the distance between the nuclei of two touching atoms, and then halving that distance.



Students, you need to place the following chart into your data section and fill in the missing information.

Name	Symbol	Atomic #	Atomic Radii (pm)
Hydrogen			30
Helium			DO NOT FILL IN LEAVE BLANK
Lithium			156
Beryllium			113
Boron			83
Carbon			77
Nitrogen			70
Oxygen			66
Fluorine			62
Neon			DO NOT FILL IN LEAVE BLANK
Sodium			191
Magnesium			160
Aluminum			143
Silicon			109
Phosphorus			109
Sulfur			105
Chlorine			102
Argon			DO NOT FILL IN LEAVE BLANK

Table 6.1

TO ASSIST YOU IN PREPARING YOUR GRAPHS:

USING MICROSOFT EXCEL:

<https://www.youtube.com/watch?v=yIml8GFrGuI>

USING GOOGLE DOCS:

<https://www.google.com/search?q=making+a+graph+in+google+sheets&oq=making+a+graph&aqs=chrome.2.69i57j0l5.9143j0j7&sourceid=chrome&ie=UTF-8#kpvalbx=0>

FOR ALL VERSIONS OF MICROSOFT EXCEL or GOOGLE DOCS: (YOUR PRINTED GRAPH)
THESE STEPS CAN BE DONE BY HAND OR GENERATED ON THE COMPUTER.

Add your name, period, and group number to graph.

Connect the points of the elements in the second period (atomic # 3-9).

Do the same for the elements in the third period (atomic # 11-17).

At each point, write only the valence electron configuration for the atom and label the chemical symbol next to each atomic number to assist you.

Questions on the next page need to be printed out. You will hand in these questions and the copy of your graph one week after the completion of the lab.

Name _____
Period _____

Date _____
Lab Group # _____

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QUESTIONS: (Answer in complete sentences)

1. Describe the general trend of the atomic radii of the elements in the second period.
2. Does the same trend occur in the third period?
3. Explain, in terms of the modern atomic model, why the radii in the second period (atomic # 3-9) display this trend.
4. Explain why there is a change from atomic numbers 9 & 11. (Be specific)
5. Explain the trend indicated by atomic numbers 1, 3, & 11. (Be specific)
6. Based on the information in your graph, predict the atomic radii for atomic number 10. Is it higher or lower than Fluorine's? Using a reference and acknowledging it, research the actual value. Is your prediction right?

LAB: PERIODIC TRENDS (IONIZATION ENERGY & ELECTRONEGATIVITY)

Students: Please read the following information given below, and then on your lab day put the following already prepared in your notebooks:

1) Date, 2) Partner, 3) Title, 4) Purpose, 5) Materials, 6) Safety, and 7) Data Table (no observations section is needed)

For this lab, two excel graphs will be made using ionization energy and electronegativity data that is given below. This data will be used to graph atomic number vs. ionization energy and atomic number vs electronegativity.

No formal report necessary.

Questions on the last page need to be printed out. You will hand in these questions and the two graphs one week after the completion of the lab.

Ionization Energy and Electronegativity are two properties of an atom that determine how well the atom's valence electrons can be moved into or out of an atom.

Students, you need to place the following chart into your data section and fill in the missing information.

Name	Symbol	Atomic #	Ionization Energy (pm)	Electronegativity (pm)
Hydrogen			13.6	2.1
Helium			24.6	0
Lithium			5.4	1
Beryllium			9.3	1.5
Boron			8.3	2
Carbon			11.3	2.5
Nitrogen			14.3	3
Oxygen			13.6	3.5
Fluorine			17.4	4
Neon			21.6	0
Sodium			5.1	0.9
Magnesium			7.6	1.2
Aluminum			6	1.5
Silicon			8.2	1.8
Phosphorus			10.5	2.1
Sulfur			10.4	2.5
Chlorine			13	3
Argon			15.8	0

Table 6.2

TO ASSIST YOU IN PREPARING YOUR GRAPHS:

USING MICROSOFT EXCEL:

<https://www.youtube.com/watch?v=yIml8GFrGuI>

USING GOOGLE DOCS:

<https://www.google.com/search?q=making+a+graph+in+google+sheets&oq=making+a+graph&aqs=chrome.2.69i57j0l5.9143j0j7&sourceid=chrome&ie=UTF-8#kpvalbx=0>

FOR ALL VERSIONS OF MICROSOFT EXCEL or GOOGLE DOCS: (YOUR PRINTED GRAPH)
THESE STEPS CAN BE DONE BY HAND OR GENERATED ON THE COMPUTER.

Add your name, period, and group number to graph.

Connect the points of the elements in the second period (atomic # 3-9).

Do the same for the elements in the third period (atomic # 11-17).

At each point, label the chemical symbol next to each atomic number to assist you.

Questions on the next page need to be printed out. You will hand in these questions and the copies of your 2 graphs one week after the completion of the lab.

Name _____
Period _____

Date _____
Lab Group # _____

LAB: PERIODIC TRENDS (IONIZATION ENERGY & ELECTRONEGATIVITY)

QUESTIONS: (Answer in complete sentences)

1. What changes do you observe between the two graphs (be very specific)?
2. Define ionization energy. Which element on your graph would have the highest IE value?
3. Define electronegativity. What element on your graph would have the highest Electronegativity value?
4. Which elements moved the most as you changed the Y-axis (be specific)? _____
5. What type of elements are these? _____
6. Why would these elements have the highest reading for ionization energy and the lowest reading for electronegativity? Be specific.